UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/909,394	07/19/2001	Gang Huang	HUANG 11-1-10	9912

47396 7590 11/28/2005		EXAMINER
HITT GAINES, PC		PATHAK, SUDHANSHU C
AGERE SYSTEMS INC.		
PO BOX 832570	ART UNIT	PAPER NUMBER
RICHARDSON, TX 75083	2634	

DATE MAILED: 11/28/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.		Applicant(s)	
	09/909,394		HUANG ET AL.	
	Examiner		Art Unit	
	Sudhanshu C. Pathak		2634	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *September 6th, 2005.*

2a)☒ This action is **FINAL.** 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle,* 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-21* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-21* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *February 24th, 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
    Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1-to-21 are pending in the application.

Response to Arguments

2. Applicant's arguments filed on September 6th, 2005 have been fully considered
but they are not persuasive.

In regards to the Arguments presented that the cited combination of the AAPA in
view of Turner (4,562,425) in further view of Rappaport in further view of Alelyunas
et al. (6,553,087) does not teach recognizing zero-amplitude symbols in a QAM
signal. The AAPA discloses a communication system comprising a zero-amplitude
symbol constitutes an end-of-file symbol or separate subframes according to a
Home Phoneline Networking Alliance (HomePNA) standard using quadrature
amplitude modulation (QAM) technique to more efficiently transfer the information
across the network (Specification, Page 1, Paragraph 2, lines 1-10 & Specification,
Page 2, Paragraphs 3-4). Turner discloses a system of transmitting data through a
communication channels implementing a QAM modulation techniques (Column 1,
lines 45-68 & Column 2, lines 31-60 & Column 3, lines 60-68 & Fig.'s 1-3, 16).
Turner also discloses a QAM constellation comprising a zero amplitude symbol
(Column 4, lines 55-68 & Column 5, lines 1-20, 39-56 & Fig.'s 4-5, 8, 14-15).
Therefore, it would have been obvious to one of ordinary skill in the art at the time of
the invention that Turner teaches implementing a QAM comprising a zero-amplitude
symbol at the origin of the constellation, and this can be implemented in the system

as described in the AAPA so as to represent a certain specified information (end-of-file) according to the HomePNA standard as described in the AAPA.

In regards to the Arguments presented that Alelyunas et al. (6,553,087) does not teach recognizing a candidate symbol as being zero-amplitude symbol according to a position relative to the origin of the constellation and neighboring symbols. Alelyunas discloses demodulation of network communications signals (HPNA) for a packet data receiver (Column 1, lines 15-20, 50-63). Alelyunas also discloses the receiver to include a slicer, that chooses from set of possible valid receivable levels which most closely matches the current received signal level and a decoder that converts this selected constellation point to a set of bits in a bit stream (Column 3, lines 36-45 & Fig. 2, elements 220, 222). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that Alelyunas teaches mapping the received signals on an known constellation in the slicer and selecting the constellation point most close to the received signal level and further converting the selected constellation point into a set of bits, this can be implemented in the system as described in the AAPA in view of Turner in further view of Rappaport so as to determine the zero amplitude symbol and further this symbol is converted into a bits stream which is interpreted as "end-of-file" or "end-of-subframe" in the HomePNA standard. Therefore, as describe above the cited combination of the AAPA, Turner, Alelyunas does teach recognizing a candidate symbol as being a zero-amplitude symbol when the candidate symbol is closer to a valid level (origin) of the constellation.

In regards to the Arguments presented that Alelyunas et al. (6,553,087) discloses

a slicer table. The slicer, of the invention (instant application) as described in the

(Specification, Page 9, Paragraph 23), maps the demodulated signal on a Cartesian

plane, then compares that candidate symbol to a pre-defined ideal signal

constellation wherein the assignment is a function of the proximity of the candidate

symbol to one of a predefined symbol constellation points. This is the exact function

being performed in Alelyunas et al. (6,553,087) as described above.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set
forth in section 102 of this title, if the differences between the subject matter sought to be patented and
the prior art are such that the subject matter as a whole would have been obvious at the time the
invention was made to a person having ordinary skill in the art to which said subject matter pertains.
Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1-7 (system), 8-14 (method) are rejected under 35 U.S.C. 103(a) as being

unpatentable over the Applicant Admitted Prior Art (AAPA) in view of Turner et al.

(4,562,425) in further view of Rappaport ("Principles and Practice"; Prentice Hall

PTR; 1996; Pages 270-272) in further view of Alelyunas et al. (6,553,087).

Regarding to Claims 1-14, The Applicant Admitted Prior Art (AAPA) discloses a

communication system comprising a zero-amplitude symbol constitutes an end-of-

file symbol or separate subframes according to a Home Phoneline Networking

Alliance (HomePNA) standard using quadrature amplitude modulation (QAM)

technique to more efficiently transfer the information across the network

(Specification, Page 1, Paragraph 2, lines 1-10 & Specification, Page 2, Paragraphs

3-4). However, the AAPA does not disclose a QAM constellation comprising a zero

amplitude symbol and further an amplitude detector that extracts a candidate symbol

from said signal and locates said candidate symbol relative to constellation of

symbols; and zero-amplitude symbol interpreter, associated with said amplitude

detector, that recognizes said candidate symbol as being a zero-amplitude symbol

when said candidate symbol is closer to an origin of said constellation than to

symbols proximate thereto.

Turner discloses a system of transmitting data through a communication

channels implementing a QAM modulation techniques (Column 1, lines 45-68 &

Column 2, lines 31-60 & Column 3, lines 60-68 & Fig.'s 1-3, 16). Turner also

discloses a QAM constellation comprising a zero amplitude symbol (Column 4, lines

55-68 & Column 5, lines 1-20, 39-56 & Fig.'s 4-5, 8, 14-15). Turner also discloses

the constellation is arranged on a Cartesian plane (Fig. 1-4). Therefore, it would

have been obvious to one of ordinary skill in the art at the time of the invention that

Turner teaches implementing a QAM comprising a zero-amplitude symbol at the

origin of the constellation, and this can be implemented in the system as described

in the AAPA so as to represent a certain specified information according to the

HomePNA standard as further described in the AAPA, thus satisfying the limitation

of the claims. Furthermore, it is known to one of ordinary skill in the art at the time of

the invention that a 16-QAM constellation is arranged on a Cartesian plane.

However, the AAPA in view of Turner does not disclose an amplitude detector that

extracts a candidate symbol from said signal and locates said candidate symbol

relative to constellation of symbols; and zero-amplitude symbol interpreter, associated with said amplitude detector, that recognizes said candidate symbol as being a zero-amplitude symbol when said candidate symbol is closer to an origin of said constellation than to symbols proximate thereto.

Rappaport discloses QAM signal to include a combination of amplitude modulation and phase modulation (Page 270, Sec. 5.9.2, Eq. 5.120). Rappaport also discloses each point on the constellation in QAM to be an integral multiple of the minimum energy required for transmission (Page 270, Sec. 5.9.2, elements "E_{min}", "a_i", "b_i" & Page 271, Eq. 5.123). Rappaport also discloses the phase modulation in a QAM to be portioned into sine and cosine functions (Page 271, Eq. 5.121, 5.122). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that Rappaport teaches decoding the received QAM signal by determining the amplitude of the in-phase and quadrature components. However, the AAPA in view of Turner in further view of Rappaport does not specify decoding the QAM signal.

Alelyunas discloses demodulation of communications signals for a packet data receiver (Column 1, lines 15-20, 50-63). Alelyunas also discloses the receiver to include a slicer, that chooses from set of possible valid receivable levels which most closely matches the current received signal level and a decoder that converts this selected constellation point to a set of bits in a bit stream (Column 3, lines 25-45 & Fig. 2, elements 220, 222). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that Alelyunas teaches mapping the

received signals on an known constellation in the slicer and selecting the

constellation point most close to the received signal level and further converting the

selected constellation point into a set of bits, this can be implemented in the system

as described in the AAPA in view of Turner in further view of Rappaport so as to

determine the zero amplitude symbol and further this symbol is converted into a bits

stream which is interpreted as "end-of-file" or "end-of-subframe" in the HomePNA

standard.

5. Claims 15-21 (receiver) are rejected under 35 U.S.C. 103(a) as being

unpatentable over Alelyunas et al. (6,553,087) in view of Rappaport ("Principles

and Practice"; Prentice Hall PTR; 1996; Pages 270-272) in further view of the

Applicant Admitted Prior Art (AAPA) in further view of Turner et al. (4,562,425).

Regarding to claims 15-21, Alelyunas discloses a digital receiver comprising an

A/D converter that converts a received signal analog form to digital form (Fig. 2,

element 214); a demodulator, coupled to said A/D converter, that demodulates said

digital signal (Fig. 2, element 216); an equalizer, coupled to said demodulator, that

equalizes said digital signal (Fig. 2, element 218); a slicer, coupled to said equalizer,

that recognizes and chooses from a set of possible valid receivable levels a level, or

"point"; which most closely matches the current received signal level (Fig. 2, element

220); and a decoder converts this selected point to a set of bits in a bit stream

depending on the protocol (inverse of the encoder) (Fig. 2, element 222). Alelyunas

also discloses implementing the receiver in a HPNA (Home Phoneline Network

Alliance) standard (Column 1, lines 48-65). Alelyunas also discloses the receiver to

include a slicer, that chooses from set of possible valid receivable levels which most closely matches the current received signal level and a decoder that converts this selected constellation point to a set of bits in a bit stream (Column 3, lines 25-45 & Fig. 2, elements 220, 222). However, the Alelyunas does not disclose an amplitude detector.

Rappaport discloses QAM signal to include a combination of amplitude modulation and phase modulation (Page 270, Sec. 5.9.2, Eq. 5.120). Rappaport also discloses each point on the constellation in QAM to be an integral multiple of the minimum energy required for transmission (Page 270, Sec. 5.9.2, elements "E_{min}", "a_i", "b_i" & Page 271, Eq. 5.123). Rappaport also discloses the phase modulation in a QAM to be portioned into sine and cosine functions (Page 271, Eq. 5.121, 5.122). Therefore, it would have been obvious to one of ordinary skill in the art a the time of the invention that to decode the QAM requites amplitude detection of the in-phase and quadrature components, and this can be implemented in the receiver prior to the slicer so as to determine the corresponding point on the constellation depending on the received signal. However, Alelyunas in view of Rappaport does not disclose transmitting/receiving a QAM signal further comprising a zero-amplitude symbol so as to represent an "end -of- file" or for separating subframes according to the "HPNA" standard, and further a decoder for a zero amplitude symbol.

The Applicant Admitted Prior Art (AAPA) discloses a communication system comprising a zero-amplitude symbol constitutes an end-of-file symbol or separate

subframes according to a Home Phoneline Networking Alliance standard using

quadrature amplitude modulation (QAM) technique to more efficiently transfer the

information across the network (Specification, Page 1, Paragraph 2, lines 1-10 &

Specification, Page 2, Paragraphs 3-4). Therefore it would have been obvious to

one of ordinary skill in the art at the time of the invention that the AAPA teaches

"HPNA" standard to have a symbol to represent an "end-of-file" or an "end-of-

subframe" condition, and this can be transmitted in the transceiver as describe in

Alelyunas in view of Rappaport. However, Alelyunas in view of Rappaport in further

view of AAPA does not disclose a QAM constellation comprising a zero amplitude

symbol.

Turner discloses a system of transmitting data through a communication

channels implementing a QAM modulation techniques (Column 1, lines 45-68 &

Column 2, lines 31-60 & Column 3, lines 60-68 & Fig.'s 1-3, 16). Turner also

discloses a QAM constellation comprising a zero amplitude symbol (Column 4, lines

55-68 & Column 5, lines 1-20, 39-56 & Fig.'s 4-5, 8, 14-15). Turner also discloses

the constellation is arranged on a Cartesian plane (Fig. 1-4). Therefore, it would

have been obvious to one of ordinary skill in the art at the time of the invention that

Turner teaches implementing a QAM comprising a zero-amplitude symbol at the

origin of the constellation, and this can be implemented in the system as described

in Alelyunas in view of Rappaport in further view of AAPA so as to represent a

certain specified information according to the HomePNA standard as further

described in the Alelyunas in view of Rappaport in further view AAPA, thus satisfying

the limitation of the claims. Furthermore, it is known to one of ordinary skill in the art at the time of the invention that a 16-QAM constellation is arranged on a Cartesian plane.

Conclusion

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.
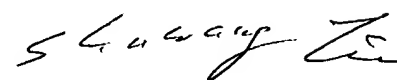
7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sudhanshu C. Pathak whose telephone number is (571)-272-3038. The examiner can normally be reached on M-F: 9am-6pm.

   - If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Chin can be reached on (571)-272-3056

   - The fax phone number for the organization where this application or proceeding is assigned is (571)-273-8300.

- Information regarding the status of an application may be obtained from

  the Patent Application Information Retrieval (PAIR) system. Status

  information for published applications may be obtained from either Private

  PAIR or Public PAIR. Status information for unpublished applications is

  available through Private PAIR only. For more information about the PAIR

  system, see http://pair-direct.uspto.gov. Should you have questions on

  access to the Private PAIR system, contact the Electronic Business

  Center (EBC) at 866-217-9197 (toll-free).

Sudhanshu C. Pathak
November 21st, 2005

SHUWANG LIU
PRIMARY EXAMINER